

Scattering properties of *Mycobacterium smegmatis*

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Light scattering investigation from *Mycobacterium smegmatis* mc2 155 was carried out at wavelength of 632.8 and 543.5 nm by using an original polar and azimuth-dependent light scattering setup. *M. smegmatis* is a gram positive bacterium and holds its importance because it is considered as a model system of *Mycobacterium tuberculosis* as it possesses all the characteristics of *M. tuberculosis* except its pathogenic behaviour. The most favorable cell density to which single scattering regime could be considered was found out before carrying out experimental investigation. Simulation of light scattering of the same particles was also carried out using a novel Monte Carlo simulation technique. The closeness of agreement or disagreement between experimental, theoretical and simulated result will be presented in this talk. One point where we focused more is the divergence found between the experimental and theoretical result, which actually gives a clue that the azimuthal dependency in light scattering experiment cannot be ruled out for bio-particles like *M. smegmatis*. Experimental and simulation analyses allowed us to understand the morphology of such bio-particles in a better way, which in turn can play an important role in characterising pathogenic *M. tuberculosis*.

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